

Solid Waste Master Plan: Road to Zero Waste

ORANGE COUNTY, NC | 2023-2045

DRAFT



Prepared for:

Orange County, North Carolina
Solid Waste Management Department
1207 Eubanks Road
Chapel Hill, NC 27516

Prepared by:

Gershman, Brickner & Bratton, Inc.
8300 Boone Blvd, Suite 500
Vienna, VA 22182



gbbinc.com





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Innovative, Sustainable Solutions for Solid Waste Management

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1 - Introduction

The Orange County (County) Solid Waste Management Department contracted with Gershman, Brickner & Bratton Inc. (GBB) to create a Solid Waste Master Plan—The Road to Zero Waste (the “Plan”). The following sections illustrate the draft of the Plan, and includes information collected from the public during outreach and engagement efforts conducted throughout this project, as well as the role of waste prevention in County planning, and operational specifics, such as input on consistent signage/messaging, and waste collection and processing options which may be advantageous to the County moving forward.

1.1 | Zero Waste Definition & Project Goals:

Orange County's forward-thinking Solid Waste Management Department operates a robust waste management program serving its residents and community members. The County seeks to implement recommendations to set the vision for an integrated solid waste management program leading to Zero Waste by 2045. In this context, “Zero Waste” is defined by the County as follows:

- The reduction of solid waste to nothing, or as close to nothing as possible, by minimizing excess consumption by means of responsible production, consumption, and reuse and maximizing the recovery of solid wastes through recycling and composting.

This Plan was then developed, in collaboration with the Solid Waste Management Department, SWAG members, and feedback from County residents, to determine the path forward to achieve Zero Waste by 2045.

Eight project goals have been established to guide the County's Zero Waste efforts:

- **Goal #1** – Develop a comprehensive and easily understandable Solid Waste Master Plan (SWMP), with identifiable action items and a plan summary.
- **Goal #2** – Develop a comprehensive strategy by 2045 that will lead to “Zero Waste,” as defined by the County.
- **Goal #3** – Integrate the Plan's efforts with the ongoing climate action plans of the County, the Municipalities, the University, and the University Health Care system.
- **Goal #4** – Select a sustainable business model that incorporates the financial, social, and environmental, including carbon footprint reduction impacts on our community.
- **Goal #5** – Identify future programs, initiatives, facilities, and infrastructure to achieve the Zero Waste goal, as defined by the County, while ensuring the long-term financial stability of the County's solid waste and recycling program.
- **Goal #6** – Identify strategies to increase public education and participation in waste reduction and waste diversion programs through awareness of reduction, reuse, recycling, and composting, while addressing ordinance and enforcement requirements.
- **Goal #7** – Develop and include an equitable, comprehensive public engagement process that effectively includes input by the general public, including groups that historically have been marginalized, and key interest groups, including the municipal and university partners, and keeps the public informed and updated on the process.
- **Goal #8** – Ensure all proposed programs and policies are in regulatory compliance with local, state, and federal requirements.

2 - How to Get to Zero Waste

The Road to Zero Waste is guided by the following questions:

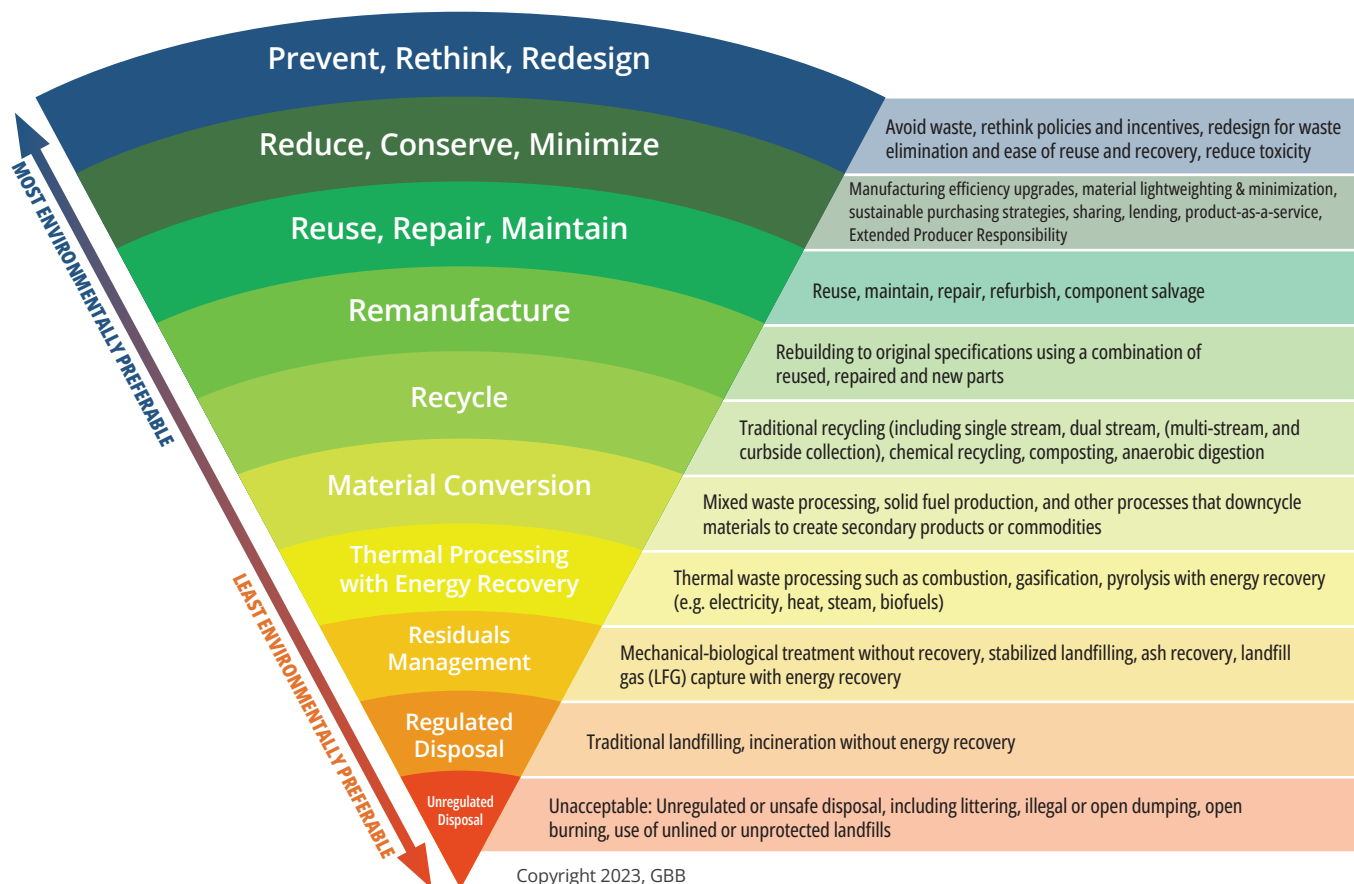
- How to prevent, reduce, reuse?
- What to recycle/divert?
- How to collect and process?
- What to do with what is left?
- How to finance?

The key pillars of Zero Waste include:

1. Reduction/reuse of materials, food capture and distribution, bulky material collection for reuse/donation, store promotion of refill/reuse packaging models.
2. Increased recycling: current curbside materials, food scraps, mattresses, electronics, paint.
3. Use of a sustainability lens for what is left.

The Sustainable Materials Management Hierarchy is a tool that GBB uses to establish preferred management practices for waste materials to prevent waste generation in the first place.

Sustainable Materials Management Hierarchy



2.1.1 | Public Engagement Timeline

Throughout the Public Engagement process, GBB and RDCG held monthly team meetings with the Internal Team to provide updates, monitor progress, and adjust as needed. As shown in Figure 1, the public engagement effort was completed efficiently and on time, with the bulk of the public feedback activities happening in October, November, and December 2022.

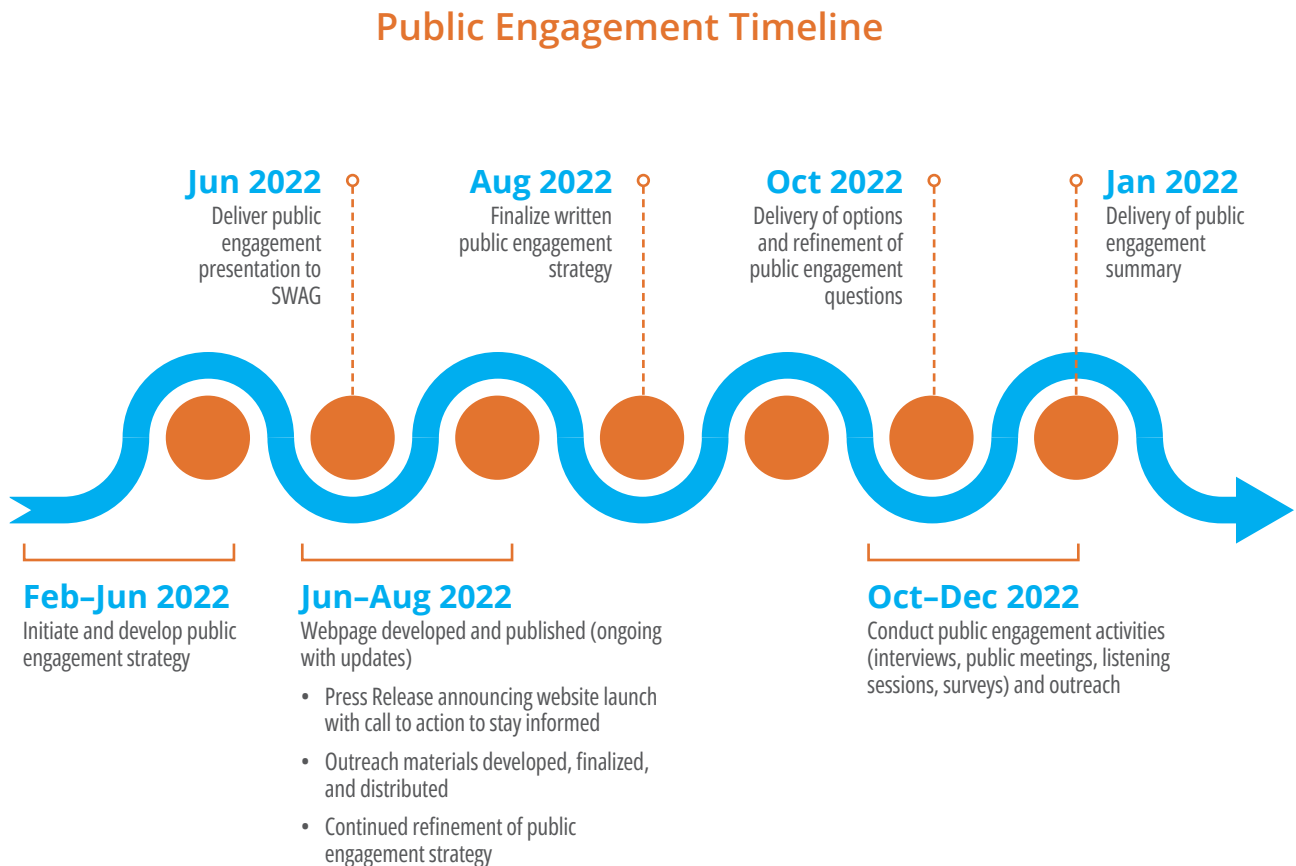


Figure 1 - Public Engagement Timeline

It is interesting to note that under the current system of waste management, most of our resources, efforts, and investments are at the bottom of the hierarchy with Residuals Management and Regulated Disposal. It is imperative that with future progress and growth, solid waste management becomes more sustainable and climate-friendly by moving up the hierarchy.

The Circular Economy is an economic system based on the reuse and regeneration of materials or products, especially as a means of continuing production in a sustainable or environmentally friendly way. Advancing the circular economy is a critical component of Zero Waste planning. This can be achieved through design that keeps products and materials in use longer, and that regenerates natural systems. A circular economy model, in combination with the Sustainable Materials Management Hierarchy, serves as the underlying foundation for the Road to Zero Waste. In the Triangle region of North Carolina, there is an organization already in place that demonstrates an effective circular economy model in action. The Circular Triangle¹ includes a Textile Incubator initiative to encourage keeping clothing in use. This is just one example of the circular economy in practice.

2.1 | Community Outreach

When developing the Road to Zero Waste Plan, the County advocated for the collection of community feedback and input throughout the planning process. By asking the community for feedback, the County was able to show how much they value the opinions of the residents they serve, and their input was able to shape the recommendations that ultimately informed the Plan. The County sought opinions and feedback from the public via the following in-person and virtual methods:

- Formed a solid waste advisory group and identified key stakeholders and one-on-one interviewees
- Held four (4) public meetings
- Promoted the efforts online through the Solid Waste Management website and social media accounts

- Participated in three (3) farmers markets located throughout the County
- Participated in a fall Shred-a-thon event
- Tabled at the Seymour Center (with the Department of Aging)
- Advertised in print media and on television
- Conducted online surveys in multiple languages (English, Spanish, Mandarin, Burmese)
- Conducted one-on-one interviews and Small Group Listening Sessions

The County prioritized seeking input from community members that have been traditionally marginalized during the public engagement effort. For focused outreach, the County held four community listening sessions, including three in-person sessions, one virtual session, and one hybrid session (mixed in-person and virtual). Interpreters were available at the public gatherings. To reach communities with limited internet access or exposure to news networks, signage and informational materials about the project were distributed in select public areas and government buildings throughout the County where residents gather. Additionally, the public survey was developed and issued in four different languages, (English, Spanish, Mandarin, and Burmese), and the project was advertised via local media outlets including newspapers, community-based radio, area newsletters, and listservs.

Further information describing the elements of the public engagement strategy, including the planning process and methodology, timeline, stakeholder identification, and specific outreach and communication activities, are included in **Appendix B – Public Engagement Summary.**

¹ Learn more about the incubator at www.circulartriangle.org.

2.2 | Public Feedback Summary

As feedback from the public was received throughout the community outreach efforts described in section 2.1, the following six (6) common themes emerged:

1. The current system is working well, but interviewees, focus group members, and public meeting attendees (the Participants) want Orange County to be on the forefront of solid waste innovation.
2. Participants desire systemic change in Orange County by putting maximum efforts toward preventing waste in the first place.
3. Participants want to invest in state-of-the-art facilities so that Orange County is equipped to handle waste within its own borders or regionally.
4. Participants overwhelmingly support increased efforts for food waste management, while also acknowledging challenges to be addressed.
5. Increased outreach and education efforts are believed to be needed, including more consistent messaging and signage and increased engagement with marginalized communities, residents of multi-family units, and residents that speak languages other than English.

6. Participants believe recycling and food waste management should be robust within the K-12 systems in Orange County.

These themes are further supported by the results of the survey. As part of the larger public engagement effort for this project, an online public opinion survey was developed and administered to solicit general feedback from those that live and work in Orange County regarding solid waste management and options the County is considering, with an emphasis on its goals to achieve Zero Waste by 2045. The survey was administered online to garner feedback that can inform the County's planning process and serve as an outreach and education opportunity regarding the County's solid waste services.

The survey was released to the public on November 2, 2022, and stayed open for six (6) weeks, through December 14, 2022. In support of the County's goal to reach traditionally marginalized community members, the survey was offered in four languages: English, Spanish, Burmese, and Mandarin. Upon closing the survey, a total of 1,401 respondents fully completed it, which exceeded the goal of 1,000 completed responses. For a summary of responses from the online survey, which are aligned with the 6 themes previously described, as well as more details about the public engagement efforts and results, see **Appendix B**.

LET YOUR VOICE BE HEARD

We need your input on Orange County's
Road to Zero Waste Plan:
orangecountync.gov/ZeroWaste



(919) 968-2788
ZeroWaste@orangecountync.gov



3 - Current Programs

In 2022, a comprehensive Current System Review was conducted as a first step in the project to lay the groundwork for public engagement efforts and the resulting plan development. The following sections contain the high-level summaries established in the Current System Review, with the full details included in **Appendix A - Current Systems Review**.

3.1 | Planning Service Area and County Governance

Orange County is in the Durham-Chapel Hill metropolitan area and is home to the University of North Carolina at Chapel Hill. The Towns of Hillsborough, Chapel Hill, and Carrboro (collectively “the Towns”), parts of the cities of Durham and Mebane, and several communities located in nearby unincorporated areas make up the Orange County solid waste service area.

Orange County operates a robust waste management program. The County is responsible for oversight of the solid waste programs and services that are offered, the financing and fees (including rate setting), and the operation of its solid waste facilities. Additionally, the County coordinates recycling, reuse, and waste reduction services. While the County consistently seeks collaboration and assistance from the Towns and its unincorporated areas, along with representatives from UNC Chapel Hill and UNC Healthcare as needed, the County is accountable for the efficiency and effectiveness of its solid waste management. The County must adhere to the policies and requirements that are set forth by the North Carolina Department of Environmental Quality (NCDEQ) and place emphases on the overall goals of waste reduction and increasing diversion from landfills and incinerators when making its solid waste management planning decisions.

The County is not responsible for the management of its commercial solid waste; rather, each business arranges its own waste pickup and disposal. However, the County does handle a portion of the commercial recycling. The Towns and the County each maintain operational, financial, and environmental authority and responsibility for the municipal solid waste (MSW) that is generated, collected, and transferred within their respective jurisdictions.

Each Town manages its own collections of MSW, while the County manages the other solid waste services listed below.

- The curbside recycling collection,
- Operation of five (5) Waste & Recycling Convenience Centers (WRCCs) and three (3) unstaffed recycling drop-off areas,
- Household hazardous waste (HHW) collection,
- Receipt and management of construction and demolition (C&D) waste,
- Yard waste management, and
- The acceptance of tires and white goods (i.e., appliances), are provided by Orange County via its Solid Waste Management Department.

Presently, the Solid Waste Management Department is organized into four (4) distinct divisions: Environmental Support, Landfill-Disposal Operations, Recycling, and Sanitation; and the Department is staffed by sixty-two (62) Full-Time Equivalent (FTE) employees, a reduction of 3-4 FTEs in recent years.

3.2 | Population Demographics and Projected Growth

As of the 2020 US census, the population of Orange County was 148,696 people—organized into 55,259 households and representing a population increase of 11% over the previous census in 2010 (see Table 1).

According to the North Carolina State Office of State Budget and Management,² Orange County's population is projected to increase to approximately 170,000 between 2030 and 2040. The state population projections for the county, as displayed below, provide population estimates through 2050 adjusted to the 2020 Census estimate.³ Population growth impacts residential MSW generation.

3.3 | Finances

3.3.1 Enterprise Fund

The activities and accounts of the Solid Waste Management Department are organized as an Enterprise Fund—the Solid Waste Landfill Fund. The Solid Waste Landfill Fund is used to account for the revenues and expenses related to the provision of solid waste and recycling activities for the citizens of Orange County. It is intended to be self-supporting through charges made to users of the Department's services. As an enterprise fund, the Solid Waste Landfill Fund carries its own fund balances. If needed, deficits are covered by the General Fund. For FY 2022, the County anticipates that the Solid Waste Landfill Fund will transfer a balance of over \$3 million to the General Fund.

² North Carolina State Office of State Budget and Management. *Projected Population of the State of North Carolina and Its Counties July 1, 2021 – July 1, 2050*. (February 2022). Retrieved from: <https://www.osbm.nc.gov/media/1547/download?attachment>

³ North Carolina Employment Projections. (2019 – 2028). Retrieved from: https://files.nc.gov/nccommerce/documents/Research-Publications/2028-Projections-Summary-Supplement-to-Press-Release_062821.pdf

3.3.2 Operations

The operating results for FY 2021 are presented in **Appendix A**. For FY 2021, the Solid Waste Landfill Fund had a net operating income of \$118,146, including transfers to the General Fund and the R&R Fund totaling \$1.99 million. Each division ran a small surplus for the year except for Environmental Support, which had a small deficit.

Table 1 - Population of Orange County Townships (2020)

Municipality	Population (2020)
Bingham Township	6,972
Cedar Grove Township	5,251
Chapel Hill Township	96,006
Town of Carrboro	21,295
Town of Chapel Hill	59,054
Unincorporated	15,657
Cheeks Township	11,050
City of Mebane	3,171
Unincorporated	7,879
Eno Township	8,437
Hillsborough Township	17,373
Town of Hillsborough	9,660
Unincorporated	7,713
Little River Township	3,607
TOTAL	148,696

Table 2 - Population Growth Estimates for Orange County

Year	Population
2030	163,718
2035	171,201
2040	178,629
2045	186,004
2050	193,327

3.3.3 Revenues

The bulk of the revenues—82.5%—are derived from the Solid Waste Programs Fee, which is a single County-wide fee assessed on each improved parcel within the County in both the incorporated and unincorporated areas of the County, as well as the portion of Chapel Hill not in the County. The fee is set annually and intended to cover the costs of County services, programs, and facilities. The current fee is \$142.00 per annum, except for the City of Mebane, which has its fee set at \$94.72. The fee is billed on the property owners' tax bill. The remainder of revenues comes from a variety of over 30 sources, including program fees, material sales, and tipping fees. The C&D Landfill tipping fee is currently \$42.00 per ton for C&D material.

3.3.4 Expenses

Operating expenses for the Department included personnel and other direct expenses, including supplies, maintenance and repairs, and utilities. They also include almost \$1.7 million for contract services, primarily for recycling collection and transportation services. See **Appendix A** for the summary of current contracts.

As of FY 2021, the County Solid Waste Landfill Fund had \$6,324,039 in outstanding debt and a requirement of \$7,346,899 for closure/post-closure of its landfills. The Fund expended about \$1.15 million in new capital expenditures, paid for primarily by transferring funds from the operating budget. At the close of FY 2021, the balance in the Solid Waste Landfill Fund was \$11,032,195.

4 - Solid Waste Management System Inventory

The Current Systems Review also took an in-depth look at the existing collections policies and practices, including a description of the current collections routes and fleet information.

The Solid Waste Management Department provides residential Every Other Week (EOW) single-stream recyclables collection to homes in the county's unincorporated areas. The Department operates three (3) residential fully automated collection routes per day, Monday through Friday, for a total of thirty (30) collection routes based on the EOW level of service. The fully automated collection routes utilize 95-gallon carts provided to each serviced household by the County.

In addition to the recycling collection services, the Department provides Front-end Load (FEL) MSW collection to government buildings, with the total number of collection routes varying from zero to two (0-2) routes per day. The Department also operates a source-separated OCC FEL route for commercial and government buildings five (5) days per week. In addition to the above-described collection routes, the Department operates one to five (1-5) roll-off hook trucks daily to service the County's Waste and Recycling Centers. For additional information and details, including descriptions of the collections fleet equipment, see **Appendix A**.

4.1 | Residential Waste and Recycling

The Solid Waste Management Department operates the County's Integrated Solid Waste Management facility, located at 1518 Eubanks Road, and contains the following facilities and operations:

- Construction and Demolition Landfill
- Regulated Material Recycling Consolidation area
- Mulch/Compost management area
- Equipment Maintenance facilities
- Department's administrative offices
- Single-stream consolidation and transfer facility
- Rigid plastics consolidation and baling area
- Tires consolidation and transload site

The Department also manages the County's comprehensive Recycling Collection Programs for residential and commercial entities. A component of the residential recycling program includes the County's operation of five (5) Waste and Recycling Centers (WRCs) located throughout the County, which are free to residents to drop off single-stream household recycling items such as plastics, metals, glass, paper, and cardboard. In addition, two of the WRCs include opportunities for residents to drop off Household Hazardous Waste (HHW) and food waste.

The collection of trash (also known as municipal solid waste or MSW) is provided to County residents by the towns themselves. The specific programs offered, the service levels, the amount of material managed, and the collection costs vary by town. To view the residential collection services offered by each town and in the unincorporated areas, including the locations that each town delivers their collected materials to after collection, as well as the prices charged per ton, see **Appendix A**.

The County provides single-stream recycling collection services for residential households, multifamily units, some commercial business locations, and government buildings in the Towns of Carrboro, Hillsborough, and Chapel Hill through an agreement with GFL. One recycling cart is provided to each residence at no charge. If additional recycling carts are desired, residents can rent another one for a one-time \$60 fee. Single-stream recyclables are collected from these urban areas by GFL weekly and in rural areas (outside of the incorporated limits) on a biweekly basis by the Orange County Solid Waste Management Department. Both GFL and the County deliver the single-stream recyclables to the County's Eubanks Road facility for subsequent transfer to the WM material recovery facility (MRF) in Morrisville, NC.

The total costs of the MSW, recycling, and yard waste collection programs, including the costs of tonnage collection, disposal, overhead, and cost per household, are outlined in detail in **Appendix A**.

4.2 | Commercial and Institutional Waste

For commercial recyclables collection, Orange County provides single-stream recycling collection (subject to available funding) to all bars, restaurants, and some commercial establishments in the county. The County provides collection for all local government buildings and Orange County Water and Sewer Authority (OWASA) buildings. The Public Schools are serviced through fee-based contracts negotiated directly with the individual school system.⁴ Collection of MSW from all commercial establishments, businesses, and industrial centers is provided by private waste collection companies, and the total amount of commercial and industrial MSW which is collected in the county is unknown at this time.

4.3 | Construction & Demolition Waste

The County operates a Construction and Demolition (C&D) waste landfill at the Eubanks Road Facility. The Landfill is permitted by the North Carolina Department of Environmental Quality (NC DEQ) and is in Phase 2 of its development. For further information about the C&D program, including the amount of C&D waste disposed of by residents and commercial haulers, as well as the operating hours and disposal fees, see **Appendix A**.

Through discussions with County operations management, it is understood that C&D waste generated in the County is disposed of in several C&D facilities in and adjacent to the County. A more thorough evaluation of C&D facilities other than the County's will yield a better understanding of the present C&D waste tonnages generated in the County. An additional opportunity to capture C&D waste tonnage information would arise from the reactivation of the County's hauler licensing and annual reporting ordinance.

⁴ Interlocal Agreement- Co. and Towns 2018. Appendix B. provided by Orange County Solid Waste Department

4.4 | Green Waste

The County operates a yard waste (or “green waste”) management program that consists of WRCs and drop-off collection points. For larger loads of yard waste, there is a drop-off location at the landfill on Eubanks Road. Materials are self-hauled by residents or delivered by commercial haulers. A total of 8,714 tons of green waste was accepted in 2020-2021. Further details regarding the mulch collection, processing, and sale of finished mulch products are included in **Appendix A**.

4.5 | Food Waste

Residential food waste is accepted at both County-operated and County-supported drop-off centers, such as the Carrboro Farmer’s Market, Chapel Hill Farmer’s Market, Hillsborough Farmer’s Market, and the Eubanks Road and Walnut Grove Church WRCs. Food waste collection is available to a portion of the restaurant, food preparation, supermarket, and other pre- and post-consumer approved commercial locations that meet a County-established minimum monthly generated threshold and can adhere to quality requirements and accessibility. Food waste dropped off and managed at County centers is collected under contract by Brooks Contractor, a private composting company with a compost facility in Chatham County. Further details regarding the food waste collection, processing, and sale of finished compost are included in **Appendix A**.

4.6 | Glass

The County offers a separate glass recycling program called Glass on the Side (GOTS). Glass recycling dumpsters are available at all five (5) Waste and Recycling Centers and at all four (4) of the 24-hour drop off sites. These dumpsters accept glass bottles and jars. The separated glass is then sent to a glass processor in Wilson, NC, to be turned into new products, including bottles and jars, fiberglass insulation, sand-blasting media, reflective paint beads, and more. Keeping the glass separate improves

the quality of the material through reduced contamination and yields more efficient recycling. In addition to the glass collected from residents, a large quantity of the glass collected through this program comes from nearby restaurants and bars.

Orange County is in partnership with Alamance County and Durham County for the glass recycling program. Alamance and Durham bring their glass to the Orange County Glass Consolidation Area, where it is weighed, aggregated and then sent to Strategic Materials in Wilson, NC.⁵

4.7 | Special Wastes

Special Waste includes materials collected at the WRCs distinct from Household Hazardous Waste and includes used motor oil, used oil filters, used antifreeze, lead-acid and dry cell batteries, fluorescent bulbs/lights containing mercury, propane tanks, and used cooking oil/waste vegetable oil. Total amounts of special wastes collected are available in **Appendix A**.

4.7.1 Tires

Tires collected at WRCs are picked up based on an agreement with New River Tire Recycling, LLC, in Surry County. The term of the agreement is May 1, 2017, through April 30, 2022, with a new, two-year extension ending April 30, 2024. The County provides trailers, and County staff loads and delivers the tires to New River’s facility in Pilot Mountain, NC for processing. The processed tires are converted to tire-derived fuel, aggregate, or mulch products. The plastic bags that are collected at Orange County’s WRCs have been previously collected for recycling by Harris Tetter, a regional chain of grocery stores. While Harris Tetter is no longer taking these film plastics, a new collection outlet is currently being sought by the County.

⁵Website for Strategic Materials, <https://www.smi.com/>

4.7.2 Electronics

As of 2021, Orange County uses a state contract with Synergy Recycling in Rockingham County as the recycler for the county's received electronic waste (or "e-waste"). In 2019, the County used the services of Ecycle Secure in Mecklenburg County, NC, under a state contract. Synergy Recycling and Ecycle Secure offer end-of-life processing, including manual or mechanical disassembly of electronic waste and disposal of unrecyclable materials. The County does perform primary deconstruction at the Eubanks Road Operations Facility, separating the electronic materials into the base material, which can then be palletized and sent on to Synergy.

4.7.3 Hazardous Household Waste (HHW)

The County provides HHW collection at the Eubanks Road and Walnut Grove WRCs. This program services an estimated 12,432 residents based on FY 2021 information.⁶ Materials are self-hauled by residents to the two permanent drop-off locations—Eubanks Road and Walnut Grove Church Road WRCs. During FY 2021, the County contracted with several private companies to manage the collected HHW, including Interstate, Tradebe, and CleanLites. Noble Oil offers used oil recycling in which the oil is converted into lubricant and oil filter recycling. CleanLites provides battery recycling services, and Tradebe offers safe hazardous waste disposal, including chemical reuse and solvent distillation, compressed gas cylinder management, and high hazardous waste disposal. About 208,196 pounds of HHW were accepted at WRCs in FY 2020-2021.⁷

4.7.4 Bulky Wastes/Furniture

Bulky rigid plastics are brought from the WRCs to the facility at 1518 Eubanks Road. At the Eubanks Road facility, the rigid plastics are baled and loaded into semi-trailers by the County, and WM collects the semi-trailers with their trucks. Other large bulky waste and furniture are collected at the WRCs, brought to the Eubanks Road facility, and then brought to the WM MRF by Orange County personnel.

4.7.5 White Goods/Appliances

The total tonnage of the County's white goods (appliances) is available in **Appendix A**. Clean Harbors CR Supply Company in Durham is the firm used as the processor. The white goods are sent to Metal Recyclers in Charlotte for recycling after the County removes the freon from appliances.

In 2022, GBB staff conducted on-site visits to the County's current landfill and transfer station facilities. A detailed description of the observations made regarding conditions and operations at the County's existing facilities, including the Eubanks Road Facilities, the Consolidation and Transfer (North Facility), the Eubanks Road South Closed MSW Landfill, and the Eubanks Road Active C&D Landfill, can be found in **Appendix A**.

⁶ Appendix B: Interlocal Agreement- Co. and Towns 2018

⁷ Orange County Local Government Annual Report Form 2020-21 FINAL-Battery adj 9-01-2021

5 - County Landfill and Transfer Station Facilities

5.1 | Waste and Recycling Centers and Drop-off Locations

Residents can drop off household materials at one of the five (5) staffed Waste and Recycling Centers (WRCs):

- Eubanks Road Waste and Recycling Center in Chapel Hill,
- Walnut Grove Church Waste and Recycling Center in Hillsborough,
- Bradshaw Quarry Road Center in Mebane,
- Ferguson Road Center in Chapel Hill, and
- High Rock Road Center in Efland locations.

These centers are available for all Orange County residents to drop off materials like household waste, plastic film, batteries, oil, oil filters, antifreeze, electronics, hazardous waste, clean-dry paper, metal cans, glass bottles, and jars, plastic bottles/tubs/cups, drink/milk cartons, cardboard, aerosol cans, aluminum foil/trays, and food waste.⁸ The collected single-stream materials at the centers include clean-dry paper, metal cans, glass bottles and jars, plastic bottles/tubs/cups, drink/milk cartons, cardboard, aerosol cans, and aluminum foil/trays.⁹ Orange County's Solid Waste Management A-Z Recycle Guide¹⁰ is available to residents and provides information on managing items and diverting as many as possible from the landfill.

Orange County also operates three (3) recycling drop-off locations that are free and available to residents and businesses 24 hours per day, 7 days per week for the collection of conventional single-stream recycling and corrugated cardboard only. Accepted streams include single-stream recyclables, cardboard, and separate glass recycling (GOTS program). The locations of the drop-off facilities are:

- Cedar Falls Park at 401 Weaver Dairy Road, Chapel Hill, NC 27516
- Hampton Pointe: Behind Home Depot, at 625 Hampton Pointe Blvd, Hillsborough, NC 27278
- Meadowmont: Behind Harris Teeter, at 116 West Barbee Chapel Rd, Chapel Hill, NC 27517

The operational aspects of the WRCs and drop-off locations, including signage and labeling, containers capacity and condition, and other details, are discussed in **Appendix A**. A summary of materials accepted at all WRCs is included in **Appendix C - Integrated Systems Report**.

5.2 | Material Recovery Facilities

The privately owned and operated material recovery facilities (MRFs) and transfer stations that the County works with for its collected single-stream recyclables are described in Appendix A. These facilities include:

- WM's Recycle America material recovery facility (MRF) in Morrisville, NC,
- WM Transfer Station at Globe Road in Morrisville (co-located with the MRF), and
- GFL's Durham Transfer Station.

⁸ Interlocal Agreement- Co. and Towns 2018. Appendix B. provided by Orange County Solid Waste Department

⁹ Interlocal Agreement- Co. and Towns 2018. Appendix B. provided by Orange County Solid Waste Department

¹⁰ A-Z Recycle Guide: <https://www.orangecountync.gov/150/A-Z-Recycle-Guide>

5.3 | Mulching and Composting Facilities

Orange County works to divert yard waste (“green waste”) and food waste (or “food scraps”) from the landfill. Both mulch and compost are created and sold for use in garden and landscape projects throughout the County. The mulch is made by the County from clean yard waste that is brought to the landfill by residents, local government collection programs, and contractors of the County, and is processed at the Eubanks Road Operations Facility. The mulch is also sold in bulk at this facility.

The compost is produced by Brooks Contractors, a commercial composting firm located in Goldston, North Carolina. Food waste material is collected in the County’s various food waste collection programs and combined with other organic materials, such as manure, wood chips, and agricultural wastes, to create the feedstock for the finished compost product. CompostNow is contracted with Brooks to collect food waste.

Orange County hosts organic food and food-related paper waste drop-offs at the Walnut Grove Church Road and Eubanks Road WRCs. The County also supports organic food and food-related paper waste drop-off at the Carrboro, Hillsborough, and Chapel Hill Farmer’s Markets. In addition to these drop-off opportunities for food waste, the County supports food waste collection from area restaurants, florists, and other higher generators of food waste. For residential use, the County sells compost bins¹¹ to the public through its Solid Waste Management Department Administration Office and works to foster the development of at-home compost for individuals’ yard waste, brown leaves, and kitchen fruit and vegetable scraps via robust education initiatives.

Compost education is a County priority, as evidenced by the informative how-to materials available on the Solid Waste Management Department’s website and its two (2) compost demonstration sites located at the Chapel Hill Community Center and the Orange County Solid Waste Management Administrative Office. Orange County offers composting education classes at

these sites throughout the year and will also work with interested organizations, schools, or businesses to provide composting education on a desired basis. All these educational opportunities are provided at no charge to the public.

5.4 | Enforcement

The Towns authorize enforcement of the County’s Regulated Recyclable Material Ordinance (RRMO) within each town’s municipal limits.¹² Each town may assist in the enforcement of the County’s RRMO within their jurisdiction using their staff in coordination with the County. The Towns monitor waste collection for banned materials to prevent the delivery of banned materials for disposal. The County provides solid waste plan advice, review, and approvals in concert with development applications to the Towns. The County assists the Towns’ staff in enforcing the RRMO and landfill bans on privately collected waste containers. The Town of Chapel Hill shall, by whatever means are legally required, authorize the County to provide the Services within that part of the town situated in Durham County.

The County, in cooperation with the Towns, is responsible for developing and timely submission of required annual reporting and solid waste management planning to the North Carolina Department of Environmental Quality (NC DEQ). The County also certifies Material Reclamation Facilities for C&D recycling processing. Materials from construction projects must comply with RRMO, and materials must go to certified facilities. Currently, the County has four (4) listed certified facilities.

¹¹ Source: <https://www.orangecountync.gov/965/Mulch-Compost>

¹² Interlocal Agreement – County and Towns, 2018. Retrieved from Orange County’s Solid Waste Management Department.

5.5 | Permitting & Licensing Requirements of Future Facilities & Operations

Most of the County's facilities and operations, as well as those of the private sector, are required to be permitted and licensed under several state and county regulations and ordinances for those that manage solid waste. Currently, the solid waste facilities on Eubanks Road¹³ are permitted under a life of site permit (NCDEQ Solid Waste Permit 68-01) and the active C&D landfill is permitted to operate under NCDEQ Solid Waste Permit 68-04. Any changes, such as expansions of operations, or the addition of new activities, will require modification of the existing permit. In addition, the facility also has an NPDES stormwater permit for solid waste facilities issued by the NCDEQ Division of Water Resources.

The various waste and recycling centers around the County do not require NCDEQ Solid Waste Section permitting. However, the HHW facilities at the Eubanks and Walnut Grove Facilities are permitted. In addition, if the activities on these sites change from the current activities, additional permitting may be required. All Sites operated by Orange County Solid Waste are subject to current zoning regulations of the location in which they are located (Town of Chapel Hill, Town of Hillsborough, Orange County, etc.).

¹³ Other than the HHW at the Eubanks Waste and Recycling Center, no permit is needed for the residential collection.



6 - The Road to Zero Waste

The impact of the Plan focuses on increasing recycling plus the diversion of yard and food waste tonnages. The key factors for a Zero Waste future in Orange County are as follows:

- Change – In order to achieve Zero Waste, it will be necessary to implement system-wide changes. If the recommended actions are not undertaken, the 2045 Zero Waste Goal will not be achievable.
- Population Growth – As noted in Section 3 above, the County's population is projected to increase by 18% from 2020 to 2040. With a higher population comes more waste materials and disposal to manage.
 - Based on population waste generation estimates, there should be more MSW attributable to Orange County and the Towns than is captured and processed by them presently because MSW collection is handled by the municipalities and/or under private waste collection and disposal.
 - Recognizing the present limited collection of MSW, the County has the most control over increasing and tracking the diversion of recyclables and yard/food waste.
- Triangle J Consortium – Continued collaboration between the County and Triangle J on solid waste issues.
- Recycling Collection – The County takes over urban recycling collection, beginning in July 2024.
- C&D Landfill – Extend the life of the landfill via diverting more recyclables from C&D material. The C&D Landfill has 20+ years of life remaining at the current fill rate, so managing C&D waste will become increasingly critical moving forward.
- Control – The County does not currently control all aspects of solid waste collection.
 - MSW is currently only collected from WRCs and from select government buildings and schools.
 - Food Waste Collection sites are particularly dependent upon the Farmers Markets remaining open in their current locations, otherwise they may have to move, which would have a negative impact on program use.
 - The County can build upon the success of its current food waste collection at restaurants and bars.
- Eubanks Road Disposal Facility – Future facility investment is critical for County control of materials including MSW. At present, there are significant limitations at the Eubanks Road Disposal Facility, which are coupled with adjacent community concerns.

6.1 | Road to Zero Waste Scenarios and Recommendations

Three scenarios were developed to help guide the County in advancing an effective Road to Zero Waste strategy. The three scenarios require varying degrees of infrastructure, funding, and programming. The evaluation of recommendations includes the following elements: public input, financial impacts, environmental impacts, equity impacts, and lifecycle impacts. They are listed as follows:

SCENARIO 1

No current facility changes, no new programs, and current program adjustments. Includes an additional 4 full-time employees and \$200,000 estimated to cover materials and fees. - **LOWEST COST, LEAST IMPACT.**

Recommendation	Focus Area	Details
1A	Marketing	Update website/zero waste imagery, feature increased transparency; Ongoing public education & social media posting; Expand use of the app; Create tangible rallying point with interim success indicator in 2030.
1B	Marketing	Focus on all language speakers in signage/messaging.
1C	Waste Prevention	Raise awareness on reuse and waste prevention (refillables).
1D	Policy	Advocate for more material bans and revise solid waste ordinance.
1E	Policy	Create County-level commercial and multifamily recycling requirements.
1F	Partnerships	Innovation partnerships with UNC and UNC health system.
1G	Waste Prevention	County purchasing for waste prevention and ag related to food waste.
1H	Waste Prevention	Consider becoming part of reuse marketplace. Options: 1. Materials Marketplace, a national virtual platform that facilitates connections to advance waste diversion of hard-to-recycle waste and by-products to become raw materials. 2. North Carolina DEQ NC Waste Trader, a free staff-managed materials marketplace for post-industrial waste and surplus commodities with markets.

- Scenario 1 leads to an additional 15,000 tons of material diverted from the landfill.
- The total annual cost of Scenario 1 is \$628,438. The impact on the SWPF would be \$9.66 per Household per year.

SCENARIO 2

Assumes all recommendations from Scenario 1 have been implemented and includes new recommendations, an additional 2 full-time employees, and \$500,000 estimated to cover materials and fees. - **MEDIUM COST, BIGGER IMPACT.**

Recommendation	Focus Area	Details
2A	Facilities	Gain consistency across all items accepted at WRCs; Expand or remove items accepted at some locations to ensure consistency across all drop-off centers and/or alternate location(s).
2B	Enforcement	Enforcement at WRCs (to prevent illegal dumping, contamination).
2C	Facilities	More accessible drop-off options/locations for multifamily buildings.
2D	Programs	Optimize recycling route collection starting June 2024.
2E	Programs	Offer multiple cart/bin sizes.
2F	Programs	Create model programs across all schools for metal, paper, plastic, glass, food waste, etc.
2G	Waste Prevention	Expand permitting incentives for deconstruction.

- ▶ Scenario 2 leads to an additional 31,000 tons of material diverted from the landfill.
- ▶ The total annual cost of Scenario 2 is \$665,600. The impact on the SWPF would be \$10.23 per Household per year.
- ▶ Scenario 2 also includes \$100,000 in year 1 to study multi-family drop-off locations.

SCENARIO 3

Includes current facility changes including development of a Sustainable Materials Management (SMM) campus, some new programs, and current program adjustments. It is estimated to cost \$175,000 master plan fees, as well as \$7M-\$12M for the new facility assuming no need to purchase property and \$250,000 for equipment, plus the addition of 5 full-time employees. Scenario 3 also includes \$1.4M for organics program development. - **HIGHEST COST, BIGGEST IMPACT.**

Recommendation	Focus Area	Details
3A	Facilities	Initiate Phased Master Plan for Eubanks Road and/or alternate location(s).
3B	Facilities	Remove high-value recyclables from C&D material before landfilling.
3C	Facilities	Consolidation of SSR transfer and MSW transfer.
3D	Programs	Organics evaluation for collection volumes.

- ▶ Scenario 3 leads to an additional 47,000 tons of material diverted from the landfill.
- ▶ The total annual cost of Scenario 3 is \$2,422,100–\$2,790,100. The impact on the SWPF would be \$37.21–\$42.87 per Household per year.

Scenario 3, which includes the recommendations for both Scenario 1 and Scenario 2, is the recommended chosen path forward for advancing Zero Waste in Orange County.

6.2 | Recommendations

The following table presents a high-level overview of each individual recommendation with specific details to follow in **Appendix C - Integrated Systems Report**.

Scenario 1 is the least expensive and least impactful, and Scenario 3 has the highest cost with the most significant zero waste impact. Scenario 2 has a medium cost with an impact more significant than Scenario 1 but less than Scenario 3.

Each scenario builds upon the previous one, meaning that Scenario 2 includes all the recommendations listed in the first Scenario in addition to the recommendations outlined in the second scenario, and Scenario 3 includes all the recommendations listed in both the first and second Scenarios in addition to the recommendations outlined in the third Scenario.

Scenario	#	Recommendation
ONE	1	Update Marketing (imagery; Public education & social media); Create a rallying point.
	2	Focus on all language speakers in signage/messaging.
	3	Raise awareness on reuse and waste prevention.
	4	Advocate for more material bans and revise the solid waste ordinance.
	5	Create County-level commercial and multifamily recycling requirements.
	6	Innovation partnerships with UNC and UNC health system.
	7	County purchasing for waste prevention/soil health.
	8	Consider becoming part of a reuse marketplace.
TWO	9	Consistency across items accepted at WRCs (with exception of HHW).
	10	Enforcement at WRCs (with staff and/or security cameras).
	11	More accessible drop-off options/locations for multifamily buildings.
	12	Offer multiple cart sizes.
	13	Create model programs across schools for waste reduction, recycling, and composting.
	14	Implement deconstruction ordinance updates/facility audits/collect C&D recycling data.
THREE	15	Phased Master Plan for Eubanks Road (Admin/Disposal Center) and/or alternate location(s).
	16	Consolidation of SSR transfer and MSW transfer.
	17	Organics program development.

6.3 | Description of Recommendations

6.3.1 Recommendation #1: Update Marketing (Imagery; Public Education & Social Media); Create a Rallying Point

Recommendation #1 includes updating Orange County's website's Solid Waste Management page, an essential tool for engaging residents in effective zero-waste practices. As such, this recommendation focuses on updating the website to show growth, progress, and revised guidance with updated images of recent events, recent office changes, updates to solid waste policies, and implementing the Road to Zero Waste Plan.

GBB recommends that the County continuously use and update its website to show a clear, consistent, and engaging message. The publishing and posting of correlating social media posts are also recommended. Since the 2045 goal is 20 years away, the County should target interim indicator(s) of success in 2030, aligning with established education and business community goals.

Achieving this recommendation means updating the website with zero waste imagery; featuring increased transparency about where materials are going once collected; ongoing public education and social media posting; expanding the use of the current Orange County NC Recycles App; creating a tangible interim zero waste rallying point for the community.

6.3.2 Recommendation #2: Focus on All Language Speakers in Signage/Messaging

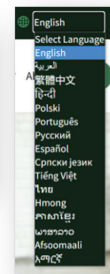
Recommendation #2 focuses on multilingual signs, which are important for the diverse community that the County serves. By guiding in multiple languages, the County will ensure that residents can understand the disposal information that the County seeks to convey to the community. This recommendation includes providing all interpretive educational materials, such as signs at the WRCs, brochures, mailers, cart decals, email blasts, and other County-provided solid waste and recycling

information, in the top three (3) most spoken languages among residents within the County's service area. This can be achieved using nearby or national translators in combination with U.S. Census data. Additionally, full utilization of the North Carolina state resources will be critical.

Achieving this recommendation means: focusing on all language speakers in signage/messaging (fully utilizing State resources) and serving all community members.



Figure 2 - North Carolina's statewide food waste prevention campaign is available in 16 languages.



6.3.3 Recommendation #3: Raise Awareness on Reuse and Waste Prevention

Recommendation #3 focuses on planning and policies on waste prevention to help eliminate waste at the source. Preventing waste and reusing materials are the first steps in a comprehensive zero-waste program. Successful waste prevention requires creative and analytical thinking first about how a reduction in materials can be accomplished, and then what can be done to reuse the materials that have been used once. For example, the County can collaborate and leverage partnerships with existing organizations such as www.bagandfilmrecycling.org, which is a drop-off directory for individuals to find participating drop-off locations for free plastic bags, film, and wrap recycling. If “Orange County NC” is entered into the search engine, 13 active locations appear.

The County could review the resource’s suggestions and potentially promote the locations and/or the resource to its residents through outreach and education efforts. To advance this recommendation, there are a number of free or low-cost edible food rescue applications for mobile or desktop devices geared to both individuals and businesses which the County can evaluate and implement (see **Appendix E - Food Waste Applications**).

Achieving this recommendation means raising awareness of reuse and waste prevention, which is the highest piece of the sustainable materials management hierarchy.

6.3.4 Recommendation #4: Advocate for More Material Bans and Revise Solid Waste Ordinance

Recommendation #4 includes updating the County’s current Solid Waste Ordinance to amend and include new solid waste management regulations that better reflect the Road to Zero Waste Plan. These amended and new regulations could clarify the requirements, update and simplify terminology, enhance reuse and recycling opportunities, and enforce recycling protocols to advance the County’s zero waste goals.

The addition of Extended Producer Responsibility (EPR) language to the Ordinance is recommended to support the County’s sustainability goals through shifting the disposal burden of a product away from the municipality and back to the manufacturer. In May 2022, a House Bill, (H.B. 1113¹⁴), was introduced to the General Assembly of North Carolina to establish extended producer responsibility for certain producers of packaging materials and to ban the manufacture and distribution of packaging materials containing certain toxic substances to protect public health. This is one example of utilizing EPR to accomplish waste reduction goals in North Carolina, which Orange County could support and emulate.

In coordination with proposing revisions to the current solid waste management regulations, it is suggested that the County advocate for material bans. Items such as film plastic bags or expanded polystyrene foam food packaging have been successfully banned in other states at present, which the County could look to as model program examples. Additionally, the County could advocate for EPR legislation for difficult-to-dispose of items, which have also been passed in other states, and shift the disposal responsibility from the municipality to the manufacturer. The national PaintCare could also be a program of interest in this regard. The County is already working with the Triangle J on the Solid Waste Consortium, including the solid waste departments of Orange County, Durham County, City of Durham, City of Raleigh, Chatham County, Town of Cary, Wake County, and tentatively Holly Springs. This consortium could prove useful for this recommendation moving ahead.

Achieving this recommendation means advocating for more material bans and revising the Solid Waste Ordinance to align with the Road to Zero Waste.

¹⁴ Source: General Assembly of North Carolina Session 2023. <https://www.ncleg.gov/Sessions/2023/Bills/House/PDF/H279v1.pdf>

6.3.5 Recommendation #5: Create County-level Commercial and Multi-family Building Recycling Requirements

Recommendation #5 would develop formal requirements for all commercial and multi-family buildings to separate recyclable materials and provide tenants/occupants adequate recycling infrastructure (i.e. bins, dumpsters) alongside regular waste disposal infrastructure. Additionally, the building managers could be required to provide recycling information/guidance to all tenants/occupants.

Achieving this recommendation means creating County-level commercial and multifamily recycling requirements.

6.3.6 Recommendation #6: Innovation Partnerships with UNC & UNC Health System

Recommendation #6 emphasizes that the County continues collaborating with and expanding its working relationships with the University of North Carolina (UNC) and the UNC Health System locally. UNC is a large waste generator in the County's service area. It already offers outreach resources and infrastructure that can help the County implement its Road to Zero Waste Plan and has engaged stakeholders through SWAG and other sustainability efforts in the region, which the County should fully engage. UNC and the UNC health system are vital resources concerning solid waste management. Expanding the partnership between the County and UNC involves ramping up communication between the entities through regularly scheduled on-campus meetings with stakeholders, as well as joint advertising and promotion of waste information within the community, and for the County to consider formalizing for-credit internship opportunities for UNC students. Durham Tech should also be included in planning for similar partnerships to UNC.

Achieving this recommendation means furthering innovative partnerships with UNC and UNC health system.

6.3.7 Recommendation #7: County Purchasing for Waste Prevention/Soil Health

Recommendation #7 encourages all purchasing at the County level to include purchasing products made with a percentage of recycled content (minimum 25%), which creates a demand for recycled products and helps sustain local recycling programs. In addition, this recommendation includes connecting agricultural/soil services in the County or Cooperative Extension related to food waste to build partnerships and promote using compost for building soil health.

Achieving this recommendation means that the County will focus its purchasing on waste prevention and establishing partnership(s) with local agricultural or Cooperative Extension programs to collaborate on food waste/soil health initiatives.

6.3.8 Recommendation #8: Join a Reuse Marketplace

Recommendation #8 focuses on technology-driven reuse options. There are numerous reuse marketplaces in the public and private sectors for consideration by the County. Examples include North Carolina's Waste Trader, Austin's reuse marketplace, and Tennessee's reuse marketplace.

Achieving this recommendation means the County becomes part of a reuse marketplace and diverts material from the landfill for reuse.

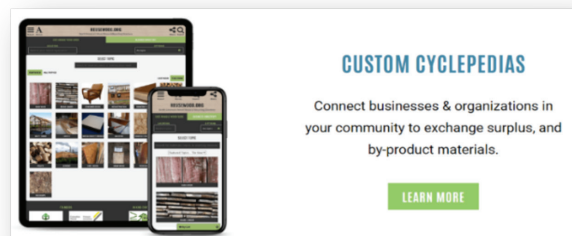


Figure 3 - Sample Reuse Technology from iWasteNot Systems

6.3.9 Recommendation #9: Consistency Across Items Accepted at WRCs

Recommendation #9 is to develop one standardized list of acceptable items for drop-off at all of Orange County's Waste and Recycling Centers (WRCs), except for HHW. As outlined in the accepted materials table in **Appendix C- Task 5 Memo**, there would be 2-7 items added at each of the WRCs (excluding HHW), including two new items suggested for all locations: expanded polystyrene (EPS, #6) and clamshell-style containers made from polyethylene terephthalate (PET, #1).

Expanded Polystyrene (EPS) is a type of thermoformed foam plastic material that is commonly used to make foam packaging. EPS is used to make a variety of items, such as single-use cups, plates, and shipping materials like "packing peanuts" and customized foam shipping inserts for specialty or delicate goods. Currently, EPS is not recyclable in Orange County, however, there are options for recycling it and reselling it into the commodity market. EPS densifiers can be purchased or leased monthly and installed with other recycling equipment to remove the air from EPS (which makes up between 90 and 98 percent of the material) using either heat or pressure to produce a densified plastic material. According to several providers of equipment and brokers of densified EPS, a 200- to 300-pound-per-hour densifier can be leased for approximately \$900 per month, and densified EPS can be sold for about \$0.40 per pound. Depending on the specification and configuration of the equipment, the costs may be more or less.

Clamshell-style containers are thermoformed from plastics, such as EPS and PET. Typically, consumers encounter clamshell containers made of #1 PET at grocery stores in the produce, dairy, and dry goods sections to hold foods such as berries, lettuce, nuts, eggs, and baked goods. In fact, the containers are commonly known as "berry boxes" and "plastic egg crates." Fortunately, there are PET reclaimers throughout the United States, with many of them located in the Southeast. There are multiple PET reclaimers in North Carolina, as described by the National Association for PET Container Resources (NAPCOR)¹⁵. The County

could potentially reconsider the viability of collecting and selling #1 PET into the recycled commodity market. With respect to the collection of PET containers, there have been advancements in reverse vending technology for the County's consideration at WRCs or by partnering with grocery stores to place reverse vending machines throughout the community. These machines can collect a variety of recyclable packaging types, including #1 PET containers.

Achieving this recommendation means gaining consistency across all items accepted at WRCs and, ideally, expanding the list of accepted materials to align with waste diversion goals and public demand.

The Recycling Partnership has organized a [PET Recycling Coalition](#), and is currently sponsoring [PET Recycling Grants](#) (Round 7 of grants are due July 31, 2023) for publicly, privately, or non-profit-owned and operated material recovery facilities (MRFs), secondary sortation facilities, or PET reclaimers in North America.

Learn more about this at recyclingpartnership.org/pet-recycling-coalition/

¹⁵ List of PET reclaimers in the US: <https://napcor.com/recycling/pet-reclaimers/>

6.3.10 Recommendation #10: Enforcement at Unstaffed WRCs: Staff and/or Cameras

In the present system, the Towns authorize enforcement of the County's Regulated Recyclable Material Ordinance (RRMO) within their municipal limits. The County assists the Towns' staff members in enforcing the RRMO and landfill bans on privately collected waste containers. Recommendation #10 is to expand the enforcement at each drop-off site through improved surveillance, (additional security cameras), and/or the addition of full- or part-time personnel (staff) positions to oversee residents' and the follow-through of regulations. This recommendation means enforcing that residents drop off acceptable items only (especially at the unstaffed 24-hour sites) and that they place the materials into the correct containers to reduce contamination and increase the value of the materials. This effort will also serve as an added opportunity to provide waste guidance and education.

Achieving this recommendation means implementing enforcement at WRCs (illegal dumping, littering and contamination) through additional staff and/or security cameras.

6.3.11 Recommendation #11: Accessible Drop-off Options/ Locations for Multi-family Buildings

Recommendation #11 increases the number of drop-off opportunities within proximity to multi-family buildings and lower-income areas in the County to increase the convenience and accessibility of recycling infrastructure for those who live there and may not be able to travel to the current WRC locations.

Achieving this recommendation means more accessible drop-off options/locations for multifamily buildings.

6.3.12 Recommendation #12: Offer Multiple Cart Sizes

Recommendation #12 suggests offering recycling carts of multiple sizes to customers. Offering more than one size option makes recycling easier for residents who require smaller cart sizes for accessibility. Multiple cart sizes could lead to increased participation in recycling.

Achieving this recommendation means offering multiple cart sizes to increase participation by increasing accessibility to aging or disabled customers.

6.3.13 Recommendation #13: Model Waste Diversion Programs Across Schools

A strong and consistent waste reduction, composting, and recycling program within schools would become a key driver for implementing zero-waste models in the County. Recommendation #13 focuses on educating the community's children on proper sorting and recycling habits in school. As they grow up in the County, they will already understand and may be accustomed to best practices in recycling, as deemed by the County. The ultimate success of the Road to Zero Waste Plan will be supported by instilling good habits early. Additionally, the school system generates a large amount of waste material, having a model program across all schools will not only have educational benefits, but it will also help the County reduce and manage its waste.

Achieving this recommendation means creating model programs across all schools for managing recyclables, and that is mirrored at the WRCs.

6.3.14 Recommendation #14: Deconstruction Ordinance, Updates, Audit/Collect C&D Recycling Data

Since 2002, the County certifies processors for Construction and Demolition (C&D) waste material. Materials from construction projects must comply with the Regulated Recyclable Materials Ordinance (RRMO), and materials must go to certified facilities. Currently, the County has four (4) listed certified facilities for processing. Recommendation #14 focuses on ordinance updates and more fully enforcing the current RRMO via audits and other means.

Achieving this recommendation means expanding permitting incentives for deconstruction. The current C&D landfill has 20+ years of life remaining at the current fill rate. Diverting more recyclables from C&D material will extend the life of the landfill.

6.3.15 Recommendation #15: Phased Master Plan for Eubanks Road Facility (Admin/Disposal Center) and/or Alternate Location(s)

Recommendation #15 centers on the Eubanks Road facility (including the Admin building and Disposal Center) which currently has significant limitations and adjacent community concerns. There is a clear need to improve the Material Recovery Facility, including a new covered facility to address the transfer/processing of SSR and incorporate other material streams now separated. Co-located material recovery operations could gain staffing efficiencies in a single location. Master planning is needed to relocate the Maintenance facility and yard to make room for expanded processing. Alternative locations should be considered with community input.

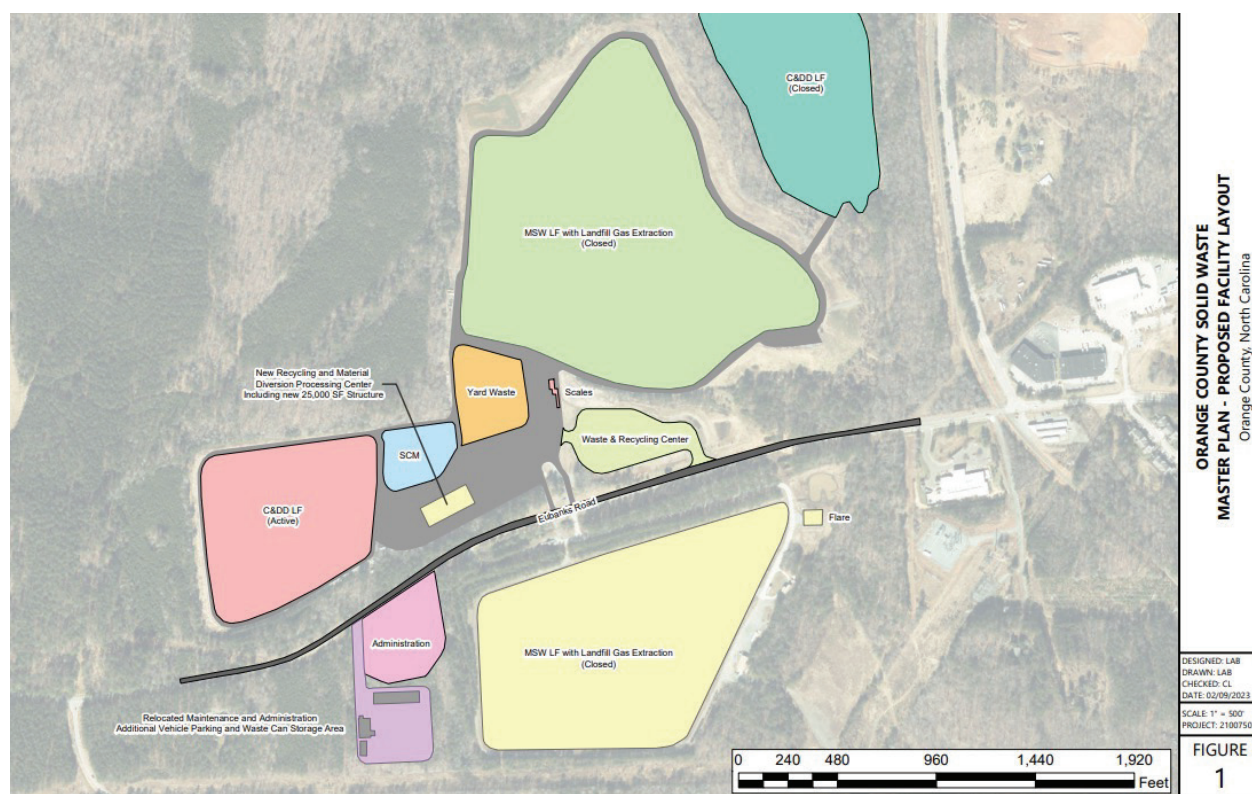
Achieving this recommendation means initiating a master plan for Eubanks Road Facility and/or alternate locations.

6.3.16 Recommendation #16: Consolidation of SSR Transfer and MSW Transfer

Recommendation #16 presents a strategy for the future. As noted, the County cannot achieve Zero Waste without change; however, most critically, community buy-in and support is vital to success. Population growth is projected to be 18% from 2020 to 2040. Currently, the County does not control most of the residential waste collection nor commercial solid waste collection. Through

this recommendation, the County can aim to more efficiently collect and transfer what is being collected (MSW and SSR) to other regional processing. MSW is now collected from WRCs and select government buildings and schools (6,000 tons annually); however, solid waste planning is taking place with regional partners, and the County is taking on recycling collection in July 2024.

Achieving this recommendation means more efficiently collecting material in the County to reduce vehicle miles traveled and allow the County more cost control in the future.



6.3.17 Recommendation #17: Organics Program Development

Recommendation #17 would expand the commercial organics program in place, in which the County provides collection of compostables from bars, restaurants, and other eligible businesses throughout the County. Through this recommendation, the County would double the current commercial organics program cost as well as set the stage for a residential pilot program.

Concerning organics materials, the County maintains an existing contract between the Solid Waste Management Department and Judy D. Brooks Contractor, Inc. for commercial organics collections, hauling, and processing services. In this agreement, the County oversees the contractor-approved collection and composting of pre-and post-consumer organic materials from eligible food service establishments. This recommendation also intends to double the current collection beyond participating commercial establishments and start to plan a residential pilot. A residential pilot program should be implemented first to test the process and work out the potential issues and will then be extended to other residential areas.

Additionally, to support composting,¹⁶ the County could work with the Orange County Master Gardeners to roll out a Master Composter program, (or train Master Gardeners in outreach tools for Backyard Composting), through the North Carolina State University Cooperative Extension.¹⁷ As a land-grant university, North Carolina State has an imperative to serve agriculture, which includes horticulture and home composting. For a point of reference, Washington, D.C., NYC, and several counties throughout New York, through the Cornell Cooperative Extension, have Master Composter programs¹⁸ that could be mimicked.

Achieving this recommendation means diverting food waste, the most potent greenhouse gas material, from the landfill.

Asheville, NC, has a food waste pilot featuring unique program elements including drop-off areas which could be explored further in the County.

Another model for consideration of a pilot program that the County could look to for guidance is the [Residential Food Waste Composting Pilot Program](#) currently in place in the City of Fort Worth, Texas.

In Fort Worth's pilot, interested residents can sign up and pay a \$20 subscription fee. All fees collected by the Residential Food Scrap Composting Pilot Program are used to "make compost more accessible to agricultural producers and community gardens." After the subscription sign-up and payment is processed, the City assigns the resident a Composting Starter Kit pickup and a nearby City of Fort Worth Drop-Off Station.

The starter kit includes a 5-gallon bucket with a lid for food scraps transportation, a kitchen countertop pail, assorted educational materials and instructions, and a refrigerator magnet detailing what can and cannot be composted. Once a resident drops off their food scraps at one of the 17 collection sites across the city, they bring their bucket back home to repeat the process, and the City processes the material into compost.

¹⁶ This additional compost support information is updated language that is different from the Task 5 Memo, which is otherwise verbatim.

¹⁷ The point of contact is presently Mart Bumgarner, Extension Agent, Agriculture – Crops and Horticulture, N.C. Cooperative Extension, Orange County Center: matt.bumgarner@ncsu.edu; Phone: (919) 245-2062.

¹⁸ Example Master Composter Program for reference in Tompkins County, NY: <https://ccetompkins.org/gardening/composting/master-composters/become-a-master-composter>

6.4 | Evaluation of Recommendations

SCENARIO 1										
#	Focus Area	Recommendation	Public Input	Impact on Adjacent Systems	Equity Impact (RE: One Orange Equity Framework)	System Flexibility Over Time	Geography Coverage Area	Timeline*	Lifecycle of the Project	Impacts all Businesses & Residences?
1	Marketing	Update imagery; Public education & social media; Expand app; Creating rallying point.	Need improved website/app; prioritize making recycling easy and accessible.	None	Meets	High	Whole County	Quick win	Annually	Yes
2	Marketing	Focus on all language speakers in signage/ messaging.	Increased efforts are needed, but more importantly, to make recycling easy.	None	Meets	High	Whole County	Quick win	Annually	Yes
3	Waste Prevention	Raise awareness on reuse and waste prevention.	Desire to put maximum efforts toward preventing waste in the first place.	None	Meets	High	Whole County	Quick win	Annually	Yes
4	Policy	Advocate for more material bans and revise the solid waste ordinance.	Desire to reduce or ban some items in hospitals and schools.	None	Meets	Low	Whole County	Long	One-time	Yes
5	Policy	Create County-level commercial and multifamily recycling requirements.	Mandating commercial & multifamily recycling is a top choice.	None	Meets (w/ more universal-provided & subsidized services for MFB)	Low	Whole County	Medium	One-time	Focuses on multifamily/ business.
6	Partnerships	Innovation partnerships with UNC and UNC health system.	The current system works well but desires to be at the forefront of waste innovation.	None	Meets	High	Whole County	Ongoing	Annually	Yes
7	Waste Prevention	County purchasing for waste prevention and ag-related to food waste.	Prioritized waste prevention above all other activities.	None	N/A	High	Whole County	Short	One-time	Focuses on county business operations.
8	Waste Prevention	Consider becoming part of a reuse market place.	Most important question: "How should waste be prevented, reduced, or reused?"	None	Meets	Medium	Whole County	Short	One-time	Yes

Environmental Benefits/Air Quality
(see Appendix for tonnage projections)

Improved:
Low estimate based on EPA:
• Additional 15,000 tons of recycling
• Additional 6,000 tons of organics

Env. Benefits/GHC Avoided

Improved:
• 44,912 MTCO2E avoided
• Equivalent to 10,000 cars taken off the road

Impact on SWPF
(Residential tons only)

\$9.66
• 6.8% increase over current \$142/year

Environmental Benefits/Air Quality (see Appendix for tonnage projections)

Improved:

- Low estimate based on EPA: Additional 15,000 tons of recycling
- Additional 6,000 tons of organics

Env. Benefits/GHG Avoided

Improved:

- -44,912 MTCO₂E avoided
- Equivalent to 10,000 cars taken off the road

Impact on SWPF (Residential tons only)

\$9.66

- 6.8% increase over current \$142/year

*Timeline: Quick win (less than 1 year), 1-2 years (short), 3-5 years (medium), long 5+ years (long)

SCENARIO 2

#	Focus Area	Recommendation	Public Input	Impact on Adjacent Systems	Equity Impact (RE: One Orange Equity Framework)	System Flexibility Over Time	Geography Coverage Area	Timeline*	Lifecycle of the Project	Impacts all Businesses & Residences?
9	Facilities	Consistency across items accepted at WRCs (with exception of HHW).	Consistent schedule; carless; expanded services/access; additional materials.	Transportation /Energy: reduction in miles traveled.	Meets	Low	Whole County	Short	One-time	Yes
10	Enforcement	Enforcement at WRCs (with staff and/or security cameras).	Necessary to enforce illegal dumping & cross-contamination with more focus.	None	Meets	Medium	Whole County	Short	One-time	Yes
11	Facilities	More accessible drop-off options/locations for multifamily buildings.	Mandating commercial/multifamily recycling is among the top 2 policies desired by respondents.	None	Meets	Medium	Whole County	Short	One-time	Focuses on Multifamily
12	Programs	Offer multiple cart sizes.	The current carts are too big/heavy.	None	Meets	Low	Whole County	Short	One-time	Yes
13	Programs	Create model programs across all schools for metal, paper, plastic, glass, food waste, etc.	Food waste collection at schools is among the top 2 public space focus wanted.	None	Meets	High	Whole County	Quick win	One-time	Focuses on K-12 population and staff.
14	Waste Prevention	Implement deconstruction ordinance updates/facility audits/collect C&D recycling data.	Proactive C&D diversion among the top 2 waste prevention areas of focus wanted.	None	Meets	Low	Whole County	Long	Annually	Yes

Environmental Benefits/Air Quality
(see Appendix for tonnage projections)

Improved:
Mid-point estimate based on EPA:

- Additional 31,000 tons of recycling over now (not cumulative)
- Additional 16,000 tons of organics over now (not cumulative)

Env. Benefits/GHG Avoided

Improved:

- - 93,778 MTCO2 avoided
- Equivalent to 21,000 cars taken off the road

Impact on SWPF
(Residential tons only)

\$19.89

- Cumulative 14% increase over \$142/year

*Timeline: Quick win (less than 1 year), 1-2 years (short), 3-5 years (medium), long 5+ years (long)

SCENARIO 3										
#	Focus Area	Recommendation	Public Input	Impact on Adjacent Systems	Equity Impact (RE: One Orange Equity Framework)	System Flexibility Over Time	Geography Coverage Area	Timeline*	Lifecycle of the Project	Impacts all Businesses & Residences?
15	Facilities	Phased Master Plan for Eubanks Rd (Admin/ Disposal Center) and/or alternate location(s).	Significant structural/ layout limitations and adjacent community concerns.	Transportation /Energy: potential reduction in miles traveled.	Meets (w/ implementation at alternative site only).	Low	Whole County	Medium	One-time	Yes
16	Facilities	Consolidation of SSR transfer and MSW transfer.	The public wants a "sustainable materials management center."	Transportation /Energy: potential reduction in miles traveled.	Pending	Medium	Whole County	Medium	One-time	Yes
17	Programs	Organics program development.	Overwhelming support for increased food waste management efforts.	Wastewater from removing organics from landfill.	Pending	High	Whole County	Short	Annually	Yes

Environmental Benefits/Air Quality
(see Appendix for tonnage projections)

Improved:
Low estimate based on EPA:

- Additional 15,000 tons of recycling
- Additional 6,000 tons of organics

High estimate based on EPA:

- Additional 47,000 tons of recycling over now (not cumulative)
- Additional 26,000 tons of organics over now (not cumulative organics)

Env. Benefits/GHG Avoided

Improved:

- -142,644 MTCO2E avoided
- Equivalent to 32,000 cars taken off the road.

Impact on SWPF
(Residential tons only)

\$57.10 to \$62.76

- Cumulative 40.2%-44.2% increase over current \$142/yr.

*Timeline: Quick win (less than 1 year), 1-2 years (short), 3-5 years (medium), long 5+ years (long)

A summary of how each recommendation was evaluated according to environment, equity, flexibility, cost, and public input, as well as the financial impact and details of each scenario, including tonnage projections, is enclosed as **Appendix C - Integrated Systems Report**. The Road to Zero Waste project team recommends Scenario 3 as the chosen path forward for finalizing the Road to Zero Waste Plan.

6.5 | Moving Forward with Equity in Mind

While all the factors considered in the evaluation of each recommendation were important, equity was considered critical to the team in developing the Road to Zero Waste Plan.

Of note and in alignment with the current Road to Zero Waste Plan, in July 2015, Orange County and the Towns of Chapel Hill and Carrboro partnered with the Jackson Center and the Rogers-Eubanks Neighborhood Association to develop a proactive community plan in the Rogers-Eubanks neighborhood as sewer design and implementation progress was made. The partners proceeded to collaborate following the “Community-First” organizing model, which involved community members as principal actors in assessing and determining the course of future planning. This plan is included as **Appendix D - Mapping Our Community Future** and can serve as an example of utilizing community input to better inform the design of the Eubanks Road Waste & Recycling Center (WRC) expansion (**Recommendation #15**). The robust public outreach effort that was engaged in this project supports the County’s desire to achieve zero waste with equity in mind.

7 - Conclusion

Orange County’s forward-thinking Solid Waste Management Department operates a robust waste management program serving its residents and community members. The County seeks to implement recommendations to set the vision for an integrated solid waste management program leading to Zero Waste by 2045.

The three scenarios presented in the previous sections, and their recommendations contained within, require varying degrees of infrastructure, funding, and programming; the evaluation of which has considered public input and financial, environmental, equity, and lifecycle impacts. Myriad stakeholders, paired with the Solid Waste Advisory Group, will help to implement the Road to Zero Waste Plan moving forward.

Ultimately, the Plan seeks to optimize the solid waste system and enhance the sustainability, cost effectiveness, preservation of landfill airspace, and longevity of the system. All program recommendations will need to be implemented with consideration of partnerships, public input, equity implications, and environmental/climate implications, in addition to the financial impact to the County and its residents. The County’s Zero Waste goal by 2045 is not achievable without change. Continued community buy-in and support will be essential to success.

8 - Appendices

The following appendices are available individually at Orange County’s webpage dedicated to its Road to Zero Waste Plan:

www.orangecountync.gov/3008/Road-to-Zero-Waste-Master-Plan

A. Current System Review (April 2022)

B. Public Engagement Summary (January 2023)

C. Integrated Systems Report (June 2023)

D. Mapping our Community Future (From Rogers Road)

E. Food Waste Applications (August 2023)



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Gershman, Brickner & Bratton, Inc.

8300 Boone Blvd, Suite 500
Vienna, VA 22182

(703) 573-5800
gbbinc.com

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